

Assessment of the acceptance and effectiveness of peer-assisted learning in pediatrics

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ABSTRACT

Background: Peer-assisted learning (PAL) is the development of knowledge and skill through active help and support of equals. However, this has not been tested in medical education in India. **Objectives:** To assess the effectiveness of PAL on improvement in cognitive assessment scores and its acceptance among undergraduate medical students in one public teaching medical university in North India. **Methodology:** After approval from the Institutional Ethics Committee, three PAL sessions, 1 per week, each on specific topic, were conducted using small group discussion methodology with a faculty contact and student leader and 4–6 peer-learners, in 9th semester MBBS students. A pretest with multiple choice questions (MCQs) was followed by distribution of learning objectives and list of resource material. PAL session was conducted after 72 h, followed by posttest by MCQs and then focus group discussion (FGD) on students' experiences. **Results:** Of the 26 students enrolled, three PAL sessions was completed by 22 (84.6%) students. The correlation coefficient between pre- and post-test scores was 0.48 ($P < 0.0001$), with a 24.2% improvement in posttest scores. In the nine FGDs most said that PALs helped in the better preparation of the topic, clarifying doubts, lessened examination anxiety, improved communication skills, and increased self-confidence. **Conclusion:** PAL was well accepted, and it improved assessment scores. Therefore, it can be adopted for teaching selected topics across all subjects of MBBS course.

Key words: Acceptance, assessment, effectiveness, medical education, peer assisted learning

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INTRODUCTION

Peer-assisted learning (PAL) has been defined as “The development of knowledge and skill through active help and support among status equals or matched companions.”^[1,2] This methodology has been in use for medical education in the developed countries and shown to improve both knowledge and skills of medical students at par to what is achieved by teacher-student learning.^[3] PAL can also be seen

as a type of interactive teaching-learning. In India, 50–250 students are admitted each year in the MBBS course. Therefore, the teachers cannot give individual attention to students. Hence, there is a need for innovations in teaching-learning methods. PAL sessions, conducted, as small group discussion (SGD) is perhaps one such method. The current project was undertaken with the objective to assess the effectiveness of PAL on improvement in cognitive assessment scores, and its acceptance among undergraduate medical students in one public teaching medical university in North India.

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METHODOLOGY

This study was conducted in King George's Medical University, Lucknow, India. Institutional Ethics Committee approval was obtained before initiating the study. This was an interventional study with a before and after assessment. Participants were 9th semester MBBS students posted in pediatrics long clinic in the month of October to November 2014. Written informed consent was obtained for participation. All the students had attended the lectures on the topics to be covered in PAL sessions. In addition, they had also seen cases related to the topic in the previous as well as current posting in pediatrics. PAL methodology was adapted from that reported by Miller *et al.*^[4] Students were oriented to the ideology of PAL and methodology of conducting SGDs. Thereafter, groups of 4–6 students were made. Each group identified a student leader (SL). The faculty facilitator (FF) then oriented the SLs on how to initiate, facilitate and encourage participation from all the members, called the peer-learners (PL) and summarize, the SGDs. In each SGD, the SL initiated the discussion. Thereafter, the first PL on the right to SL spoke for about 3 min on anyone intended learning objective (ILO) of the topic for the day. The others supplemented the information in the next 2 min. Thereafter, the next PL spoke on the next ILO till all were covered. The SL summarized at the end. Each participant then wrote on a diary, self-assessment of their knowledge and areas where further reading was needed. They also noted their impressions on the group dynamics, what went well and what could have been better with reasons for both. The diaries were shown to the FF at the end of the session.

Before each PAL session, the topic to be covered was given on day 1. Thereafter, a pretest was taken on the topic by administering multiple-choice questions (MCQs). Then, the students were given the ILOs in the cognitive domain and given the list of reference books to read. They were given 3 days for reading. The group re-convened on day 4 and the PAL session was conducted as SGDs for about 45 min. This was followed by posttest as MCQs, different from those given as pretest. Then, focus group discussion (FGD) was held to collect information on their experience and expectations, what did they specifically like and their suggestions for the future.

Over a period of 15 days, three PAL sessions were carried out on growth and development, lower respiratory tract diseases and malnutrition (undernutrition) in children. At the time of recruitment of students information was collected on their gender, present age, medium of schooling, whether they studied in groups, and the marks they had obtained in first, second and third professional examinations.

We planned to give 15 MCQs as a pretest and another 15 as posttest per topic. For sample size calculation for a continuous outcome, we assumed that the mean pretest score would be 8 and after PAL session, the improvement would be 3 (37.5%) with a standard deviation of 3. Therefore for a significance level of 5%, 17 students would be needed for pretest and 17 for posttest by using formula $n = f(\alpha, \beta) \times 2s^2/\delta^2$.^[5] Data was collected using predesigned data collection instruments and entered in MS-Excel. The univariate descriptive analysis was done for the baseline variables and reported frequencies, percentage and with standard deviation, as applicable. For a comparison of categorical variables Chi-square test was used and for continuous variable Student's *t*-test used. Pearson's correlation coefficient was calculated between pre- and post-test scores. The pre- and post-test difficulty index was compared using unpaired Student's *t*-test. Using a two-tailed distribution, a $P < 0.05$ was taken as statistically significant.

The scores of the students were arranged in descending order. Students of the upper one-third were considered as high achievers and lower one-third as low achievers. The difficulty index of each of the MCQs used in pre- and post-test was computed using the formula:^[6]

$$\text{Difficulty index } (P) = ((h + l) / n) \times 100$$

Where h = Number of students who got the correct response in the top one-third (high achievers), l = Number of students who got the correct response in the bottom one-third (low achievers), n = Number of students in the top + bottom one-third (high + low achievers). Average difficulty index of pre- and post-test MCQs was compared using unpaired Student's *t*-test. Qualitative analysis was done on the responses received in the FGD.^[7] Coding schemes were developed for thematic groups. Responses were identified which eloquently depicted the student's experience or views. The frequency of codes across thematic areas in all FGDs was semi-quantitatively ascertained and reported.

RESULTS

In October to November 2014, 26 students were posted in pediatric long clinics and invited to participate in PAL sessions. All gave voluntary informed consent to participate. There were 26 participants, 14 males and 12 females. The mean age of males and females was similar being 24.3 ± 2.4 years versus 23.9 ± 1.3 years. Half the participants had received schooling in English medium. They reportedly spent approximately an average of 4 h/day studying and only one-fifth said they studied with a colleague sometimes.

Three PALs sessions were conducted. Twenty-five students appeared in all the three pretests. However, 22 students (84.6%)

participated in the PAL session and the posttests. Data from 22 students who did all the three pre- and post-tests was analyzed. In each posttest, one additional student joined who was not in the pretest and hence this student's data was not analyzed. Each topic had 15 MCQs as pretest and 15 as a posttest. The mean difficulty index of pretest versus posttest was 51.7 ± 28.6 and 64.8 ± 26.6 ($P = 0.02$). The correlation coefficient between pre- and post-test scores was 0.48 ($P < 0.0001$). Mean pretest versus posttest scores was 8.44 ± 2.86 versus 10.48 ± 2.95 , and the improvement was statistically significant ($P < 0.0001$).

Analysis of nine FGDs revealed that most felt that everyone got an opportunity to express; however, in some groups and in earlier PAL sessions the group leader tended to dominate. The group dynamics improved with time, and each member developed a sense of responsibility. Most said that the topic was prepared better and they could clarify their doubts on the discussion. They gained confidence in the topic and had less anxiety to face viva. They also compared contents from different books and then converged the knowledge. This, they said, would help them for examination. They liked the method of PALS where getting ILOs gave a direction to their studies and subsequent discussions imparted clarity and improved their verbal expression skills. Most suggested that everyone must get an opportunity to be the SL. Few suggested that only one textbook must be recommended for reading. Almost all were of the opinion that PAL was a very useful activity, more so because its marks of pre- and post-test would not be added to any assessment. PAL improved and reinforced recall. PAL sessions provided in-depth reading in contrast to the usual lectures, which were boring, and there was limited retention of knowledge. They suggested that PAL sessions should begin right from the first semester. Those topics, which were unique to a subject, could be identified for PAL sessions.

DISCUSSION

This was a feasibility study of the acceptance and effectiveness of PAL conducted for three topics on 26 final semester MBBS students posted in the pediatric long clinics in King George's Medical University over a period of 2 weeks. It showed that PAL was well accepted and improved learning as evident by a 24.2% improvement in the posttest MCQ scores.

Similar findings have been reported from Ireland^[1] where PAL was used to train 5th year medical students on the communication skills module. Qualitative data analysis was done which revealed a high level of acceptability among tutors and learners as well as reciprocity of educational exchange within the PAL setting. The current study also did qualitative analysis, which revealed similar findings.

In a review, which included 19 studies, 15 focused on SL outcomes and four on student-teacher learning outcomes.^[3] Of these, 10 studies utilized randomized allocation but most of the study participants were self-selected volunteers. Outcomes were assessed by written examinations, as done in the current study. Certain studies also assessed by observed clinical evaluations. In most, the student-teachers had been trained formally. The authors concluded that PAL or teaching in specific situations did achieve short-term learner outcomes comparable with those produced by faculty-based teaching. Furthermore, PAL has beneficial effects on student-teacher learning outcomes, as found in the current study.

In another review of 40 studies^[4] where PAL was used in the fields of nursing, physical therapy, occupational therapy, medicine, athletic training, and higher education. Overall the strategy was found to be beneficial for the students as it had elements of peer leadership, peer feedback as well as peer mentoring. However, PAL had to be viewed from the perspective of program administrators, clinical instructors, and students. Also, further research is needed on planned versus unplanned PAL. In the current study, the PAL sessions were all planned.

PAL methodology promoted healthy interaction between students as has been mentioned by other workers in this area.^[8,9] There was cooperative learning. Since the pre- and post-test scores did not form a part of the routine assessment, the students found the environment nonthreatening and conducive to learning. The method also promoted close and longer interaction with the FF, which is not usually there. Often the students are not aware of what they must know within a topic; hence the distribution of ILO was welcomed and gave them a direction to learning.

The difficulty index of posttest MCQs was significantly higher than that of the pretest. Yet the improvement in posttest performance indicates that PAL methodology does improve learning, which is reflected in assessment scores. In the future, the pre- and post-test MCQs should be randomly drawn from a larger pool of questions.

This study had certain limitations. PAL was tested only on one batch of students of one semester and posted in pediatrics only. However since these students were in the final semester, their observations could be generalized to other students and to other subjects also. It was not possible to have a comparator group with no intervention, as it would not have been ethical. Since the intervention was found beneficial, it should have been given to the entire batch of students. However, clinical posting of students had finished, as the examinations were to

begin in the month of December. It is concluded that since PAL was well accepted and improved assessment scores this can be adopted for teaching in selected topics across all subjects of MBBS.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Glynn LG, MacFarlane A, Kelly M, Cantillon P, Murphy AW. Helping each other to learn – A process evaluation of peer assisted learning. *BMC Med Educ* 2006;6:18.
2. Henning JM, Weidner TG, Marty MC. Peer assisted learning in clinical education: Literature review. *Athl Train Educ J* 2008;3:84-90.
3. Yu TC, Wilson NC, Singh PP, Lemanu DP, Hawken SJ, Hill AG. Medical students-as-teachers: A systematic review of peer-assisted teaching during medical school. *Adv Med Educ Pract* 2011;2:157-72.
4. Miller V, Oldfield E, Murtagh Y. Peer Assisted Learning Sessions. Leader Development Handbook. Available from: <http://www.science.uq.edu.au/pass/docs/other/PASS-Leader-Development-Handbook.pdf>. [Last accessed on 2015 Mar 16].
5. Cornish R. Statistics: An Introduction to Sample Size Calculations. Mathematics Learning Support Centre; 2006. Available from: <http://www.statstutor.ac.uk/resources/uploaded/sample-size.pdf>. [Last accessed on 2015 Mar 16].
6. Pande SS, Pande SR, Parat VR, Nikam AP, Agrekar SH. Correlation between difficulty and discrimination indices of MCQs in formative exam in physiology. *South East Asian J Med Educ* 2013;7:45-50.
7. Onwuegbuzie AJ, Dickinson WB, Leech NL, Zoran AG. A qualitative framework for collecting and analyzing data in focus group research. *Int J Qual Methods* 2009;8:1-21. Available from: http://www.research.apc.org/images/2/2f/A_Qualitative_Framework_for_Collecting_and_Analyzing_Data_in_Focus_Group_Research.pdf. [Last accessed on 2015 Mar 16].
8. Meerah TS, Halim L. Improve feedback on teaching and learning at the university through peer group. *Procedia Soc Behav Sci* 2011;18:633-7.
9. Abedini M, Mortazavi F, Javadinia SA, Moonaghi HK. A new teaching approach in basic sciences: Peer assisted learning. *Procedia Soc Behav Sci* 2013;83:39-43.